

PREVENTION OF ABDOMINAL ADHESIONS*

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THE prevention of postoperative adhesions depends entirely on the prevention of inflammatory reaction and in cases in which denuded surfaces are produced by the operative procedures, or in which preexisting adhesions are separated during operation, on the peritonealization of all such surfaces. If, in spite of every care, postoperative adhesions seem to be inevitable, then every effort should be made to adjust the intestines in such a way that these adhesions will not result in ileus.

Anything which bruises, abrades or irritates peritoneal surfaces predisposes to sufficient inflammatory reaction to produce adhesions. All rough handling, therefore, the catching of peritoneal surfaces with tissue forceps or clamps, or the use of irritating antiseptics like tincture of iodine, should be avoided. Dry sponges and wipes readily produce such injury and for that reason should never be used in the peritoneal cavity, but only warm moist sponges. Moist sponges are also greatly superior to dry in absorbing blood and other fluids; the advantage of such moisture was emphasized by earlier writers who spoke of such sponges as greedy; but this advantage has been largely lost sight of by modern operators. Moistening the wipes and sponges with normal salt solution instead of ordinary sterile water may perhaps render them less irritating, but that has not been demonstrated and the difference could certainly be but slight. (Some ambitious student or interne might perhaps make a study of this by animal experimentation and thus produce an interesting thesis.)

Any foreign matter in contact with peritoneal surfaces, like a cigarette drain or rubber tube, necessarily produces a degree of trauma which predisposes to

adhesions, and if left long in contact will infallibly produce them; hence when it is at all possible such drainage should be protected by being placed in contact with some fixed portion of the bowel, as the colon, or by the judicious interposition of the omentum, supported as necessary by a few stitches. This applies particularly to drainage of the gall bladder stump, which can be secured by pulling up the omentum and tucking it in between the liver and the transverse colon, fixing it in place by a few catgut sutures.

Drainage in an appendix operation is frequently necessary, but should almost invariably be secured through a stab opening far over to the right, and with the drainage itself so adjusted if possible, *by the fingers still on the inside of the abdomen*, that the omentum and cecum are utilized to prevent contact with the small intestines. The main incision can then usually be closed completely.

If on opening the abdomen preexisting adhesions are found, these should not be separated unnecessarily if they are so placed and of such a character as to offer no obstruction to peristalsis. Only such adhesions should be separated as are necessary in order to remove the pathology for which the operation is instituted. After the operation is completed every effort should be made to cover over all raw surfaces. This can frequently be done, if necessary, by rolling the affected loop of bowel upon its axis so that the raw surface is brought into contact with its own mesentery. A few stitches can then be inserted to hold it in position and thus there will be no raw surfaces exposed. Sometimes adjacent loops of bowel, each with a raw surface, can be adjusted to each other so as to safely bring the raw surfaces in contact, but care must be

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exercised that there is no space left underneath this union for the entrance of a free loop of bowel which would thus be liable to strangulation. The possibility of using the omentum in all these maneuvers should not be lost sight of, since it seems to have been developed for just such emergencies. Sutures should be of very fine silk or of fine plain or chromicized catgut, and should be inserted with great care and with the avoidance of all unnecessary exposure. It is of prime importance to avoid all tension.

The greatest liability to adhesions, however, occurs in the pelvis after operations for old inflammatory troubles which have resulted in extensive adhesions the separation of which may leave the entire surface of the true pelvis denuded. If nothing is done to protect this the omentum and small bowels will drop in and will inevitably form adhesions with resulting liability to postoperative ileus or other serious complication. This raw surface can always be completely peritonealized by making a free opening into the vault of the vagina at the completion of the operation, or leaving the upper end of the vagina open if the womb has been removed, and passing into the vagina the ends of two or three strips, according to the needs of the case, of washed iodoform gauze, the rest of the

strips being lightly placed in the pelvis as a fluff. The sigmoid is then swung around over this fluff and attached by continuous suture to the edge of the peritoneum at the brim of the pelvis. Good judgment should be used in bringing this around to see that there are no angulations produced as the stitches are inserted. In very rare cases the sigmoid is not quite sufficient, and then the space on the right can be filled by mobilization of the cecum. The omentum is then smoothly placed over the mobilized bowel and the incision closed. The gauze fluff should be removed after the lapse of one week, by catching the ends of the strips in the vagina. By that time their removal is almost or quite painless and if the opening has been made of proper size, there is no need of any replacement of the gauze. Vaginal douches should be used after removal of the fluff as needed for cleanliness. The sigmoid soon sinks down into the pelvis and thus makes a complete floor. There has been no raw surface exposed at any time.

Great care should be exercised in closing the abdominal incision to see that the edges of the peritoneum do not come in contact with the underlying intestines or omentum. The peritoneum should be closed by a running catgut stitch, with the edges carefully turned out so that such contact can be absolutely avoided.

